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ABSTRACT

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LANGUAGE, PERSONALITY, AND CROSS-CULTURAL STUDY AND MEASUREMENT OF THE HUMAN A-R-D (MOTIVATIONAL) SYSTEM

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ABSTRACT

An experiment was conducted to test the hypothesis that interest inventory items elicit classically conditionable attitudinal responses. A higher-order conditioning procedure was used in which items from the Strong Vocational Interest Blank were employed as $\overset{UC}{S}$s and nonsense syllables as $\overset{C}{S}$s. Items for which the subjects had positive interest, as indicated by a pre-test, were paired with one $\overset{C}{S}$; items of negative interest were paired with a different $\overset{C}{S}$. Analysis of post-conditioning ratings of the syllables indicated that they had acquired the attitudinal component of the interest items with which they had been paired.

INTEREST INVENTORY ITEMS AS ATTITUDE ELICITING STIMULI IN CLASSICAL CONDITIONING: A TEST OF THE A-R-D THEORY[1]

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In his application of learning principles to an analysis of motivational stimuli, Staats (1968) proposes a theory which treats several functions of stimuli within an integrated learning theory of classical and instrumental conditioning. The theory specifically postulates that if a neutral stimulus is contiguously paired, over a number of trials, with a stimulus ($\overset{UC}{S}$) which, on a conditioned or unconditioned basis, elicits a positive attitudinal (emotional) response, the neutral stimulus will acquire three interrelated functions. First, it will become a conditioned stimulus ($\overset{C}{S}$) for the same attitudinal response elicited by the $\overset{UC}{S}$; second, it will become a reinforcing stimulus ($\overset{R}{S}$), capable of strengthening instrumental behaviors that it is made contingent upon; and third, it will, as a consequence of its $\overset{C}{S}$ and $\overset{R}{S}$ properties, acquire discriminative stimulus ($\overset{D}{S}$) control over a large class of approach or "striving for" behaviors. A neutral stimulus paired with a negative $\overset{UC}{S}$ is said to acquire analogous but opposite functions.

Stimuli possessing the three functions which have been described are conceptualized as having A-R-D value, that is, attitudinal, reinforcer, and discriminative value. The complex of stimuli which, for a given individual, function in these three ways is designated as the individual's A-R-D system. Greenwald (1968) has suggested that the A-R-D theory can be employed to integrate presently diverse concepts of attitudes.

Empirical verification for parts of the A-R-D theory is provided by a series of studies in which attitudinal responses have been conditioned to words employed as conditioned stimuli. For example, in accord with the first function

of motivational stimuli, studies have shown that a neutral verbal stimulus can become a $\overset{C}{S}$ for an attitudinal response through both first-order and higher-order classical conditioning. First-order conditioning of attitudinal meaning has been demonstrated by Staats, Staats, and Heard (1962), and in a replication by Maltzman, Raskin, Gould, and Johnson (1965). In these investigations a GSR was conditioned to a $\overset{C}{S}$ word by pairing the word repeatedly with aversive $\overset{UC}{S}$ (shock and noise). In addition, the $\overset{C}{S}$ word was rated as having negative attitudinal meaning, and the intensity of the rating response was found to be positively correlated with the magnitude of the GSR.

Using as $\overset{UC}{S}$ words which already elicited attitudinal meaning responses, as indicated by a pleasant-unpleasant semantic rating scale, studies have also demonstrated higher-order conditioning of attitudinal meaning. Various types of verbal $\overset{C}{S}$s have been employed in these studies, including color names (Paivio 1964), national names (Staats & Staats, 1958), and nonsense syllables (e.g., Staats & Staats, 1957). Furthermore, an investigation using this same higher-order conditioning procedure (Staats & Staats, 1959) has shown that attitudinal meaning, like other conditioned responses, varies as a function of the number of conditioning trials.

According to the A-R-D theory, words, which as $\overset{C}{S}$s elicit attitudinal responses, should also function as reinforcing stimuli ($\overset{R}{S}$). This hypothesis is supported by an investigation which used words chosen, as in the higher-order conditioning studies, by means of an attitudinal rating scale. Each of three groups of Ss received positive, negative, or neutral attitude words contingent on one of the two motor responses. The positive attitude words functioned as positive reinforcers, the negative words as negative reinforcers, the neutral words had an inbetween effect (see Finley and Staats, 1967; Staats, 1964). Golightly and Byrne (1964) and Byrne, Griffit, and Clore (1968) have shown a related effect employing as reinforcing stimuli statements similar to the S's own stated attitudes.

The UC S words and reinforcing words which were used in the above studies to demonstrate the classical conditioning and reinforcing properties of motivational stimuli were selected,as indicated, on the basis of their ratings on an evaluative (pleasant-unpleasant) attitude rating scale. Staats (1964, 1968) has noted that many psychological tests which purport to measure various aspects of motivation (e.g., needs, values, interests) include items that are similar to semantic or attitude rating scales. In noting this characteristic of certain psychological tests, Staats uses as a primary example the Strong Vocational Interest Blank. Of the 400 items comprising the Strong more than two-thirds (280) ask the respondent to indicate whether he likes (L), is indifferent to (I), or dislikes (D) various school subjects, occupations, peculiarities of people, amusements, and activities. According to the A-R-D conceptualization, the rating of such items is controlled by the discriminative stimulus value of the rated object, which is, itself, a function of the object's reinforcement and emotion eliciting value. More specifically, when an item elicits a positive emotional response in the individual the item as a stimulus will tend to control the "striving for" motor response of checking the (L). A negative emotional response will mediate the "striving away from" response of checking the (D). Responses neutral in respect to emotion would control checking (I).

If interest inventory items do in fact conform to the A-R-D model, they should exhibit the three functions which have been described for such stimuli. That is, they should function as (1) elicitors of classically conditionable emotional responses; (2) reinforcers for instrumental behaviors; and (3) discriminative stimuli controlling approach or avoidance behaviors.

The present investigation is designed to test whether the first function of A-R-D stimuli, that of eliciting classically conditionable attitudinal responses, is possessed by interest inventory items. Items selected from Ss'

interest inventory tests were used as $\overset{UC}{S}$s in a higher-order conditioning paradigm to condition attitudinal meaning to contiguously presented nonsense syllables.

The conditioning procedure used in the study is a modification of the one developed by Staats in the studies described in which $\overset{UC}{S}$ words having a common attitude component were paired with $\overset{C}{S}$ nonsense syllables. Pilot work for the present project indicated that conditioning did not occur when the standard procedure was used. Analysis of the problem suggested that the difference in the instructions when responding to the items on the interest inventory and during the conditioning might be contributing uncontrolled variance that obscured the conditioning. To correct for this, the present procedure required S to read the Strong instructions prior to conditioning, and, also, to rate the $\overset{UC}{S}$ items during the conditioning, in accordance with these instructions.

METHOD

Subjects:

The 30 Ss who participated in the total experiment were drawn from an initial subject pool consisting of 48 female and 10 male undergraduate volunteers, who were enrolled in two sections of an educational psychology course at the University of Hawaii. From this initial pool of 58 Ss, ten had to be eliminated because they failed to meet certain selection criteria (described below). Of the remaining 48 Ss, 30 were chosen on the basis of their availability during the week scheduled for conditioning. These 30 Ss were assigned randomly to two groups, 15 Ss to a group.

Administration of the Strong Vocational Interest Blank:

In the initial contact with the Ss, they were told by the course instructor that participation in the investigation involved taking an interest inventory, and that they would then be seen individually by the experimenter who was

conducting the study. In the following class period, the instructor of the course distributed copies of the Strong Vocational Interest Blank (form W for women, form M for men) to those students who had expressed a willingness to participate in the investigation. Accompanying the test booklet were instructions indicating that males should complete only items 1 to 280 and that females should complete only items 1 to 255 and 362 to 400. The items that the Ss answered were all of those included in the inventory to which a LIKE, INDIFFERENT, or DISLIKE response was required. These included items comprising the following sections of the test: occupations, school subjects, amusements, activities, and peculiarities of people.

CS-UCS Conditioning Lists:

Three nonsense syllables (YOF, XEH, and QUG), printed on slides, served as $\overset{C}{S}$s. The syllables were projected by means of a Kodak Carousel slide projector.

$\overset{UC}{S}$s were drawn from each S's responses to the items comprising the occupational section of the Strong (for males, items 1-100; for females, items 1-128). For each S 15 items were selected which had been responded to as "liked", 15 which had been responded to as "indifferent", and 15 which had been responded to as "disliked". A random number table was used to select the items in each category of attitudinal meaning (i.e., LIKE, INDIFFERENT, DISLIKE) from the total number of items falling within that category. Ten Ss had to be excluded from the conditioning phase of the study because they did not have the requisite 15 items in one or more of the three categories. For each S a conditioning list was constructed consisting of the three $\overset{C}{S}$ nonsense syllables paired with the appropriate $\overset{UC}{S}$ items. The order of the nonsense syllables within the list was the same for all Ss. This order was random with the restriction that a syllable never appeared twice in succession.. In each S's conditioning list the

15 $\overset{UC}{Ss}$ in each of the three evaluative categories were each consistently associated with one of the three $\overset{C}{S}$ nonsense syllables. For group one YOF was always associated with negative $\overset{UC}{Ss}$ and XEH with positive $\overset{UC}{Ss}$; for group two these conditions were reversed. QUG was paired with neutral $\overset{UC}{S}$ for both groups. An example of a conditioning list is presented in Table 1.

Insert Table 1 about here

PROCEDURE

Initial Instructions and Orientation Tasks:

Ss were run individually in a small (8' by 8'), partially soundproof experimental room. Immediately after an S arrived at the experimental room and was comfortably seated, he was told that he was about to participate in an experiment which involved two types of learning tasks. One task was described as the learning of visually presented nonsense words. The other task was described as the learning of auditorily presented interest inventory items. It was indicated that the items were like those that S had encountered two weeks previously in his experience with the Strong Vocational Interest Blank. After this brief introduction to the experimental tasks, E turned on the slide projector and informed S that the nonsense syllables would be projected on the wall directly in front of him. The Ss were instructed to learn the syllables by simply relaxing and looking at them; they were specifically cautioned to avoid using any memorization devices to learn the syllables. The syllables used in this phase of the experiment were VAF, XAD, JEC, YIM, and GAH. Each of these syllables was presented three times in random order, with an exposure time of five seconds for each syllable and an approximately one second interval between syllables. After the syllables had been exposed the Ss were asked to check from a list of ten syllables those they remembered seeing.

Table 1

A Subject's Conditioning (CS-UCS) List

YOF-stenographer

QUG-publisher

XEH-surgeon

QUG -beauty specialist

XEH-interpreter

YOF-artist's model

XEH-musician

YOF-traveling saleswoman

QUG-politician

YOF-costume designer

XEH-farmer

QUG-pharmacist

XEH-gradeschool teacher

QUG-dietitian

YOF-hostess

QUG-stage actress

XEH-statistician

YOF-cartoonist

QUG-secret service woman

YOF-bookkeeper

XEH-playground director

YOF-foreign correspondent

QUG-vocational counselor

XEH-factory worker

YOF-interior decorator

XEH-proof reader

QUG-librarian

XEH-laboratory technician

YOF-stockbroker

QUG-kindergarten teacher

QUG-private secretary

YOF-author of novel

XEH-factory manager

YOF-social worker

QUG-commercial teacher

XEH-museum director

YOF-high school teacher

XEH-scientific research worker

QUG-sales manager

XEH-dentist

YOF-accountant

QUG-radio program director

YOF-civil service employee

QUG-educational director

XEH-registrar

Next, ten interest inventory-type words (e.g. anatomist, hiking, banker) were spoken by E with an approximately two second interval between the words. The Ss were instructed to avoid attempts to memorize the words and to learn them by simply listening. After the words had been spoken, the S was required to select from a list of twenty words those he remembered hearing.

Conditioning Phase:

In the conditioning phase Ss were informed that they would now be required to do both types of learning together, and, in addition, that they were to rate the words spoken by E in the same manner that they had rated certain items on the Strong. It was further specified that the words which would be spoken by E were from the occupational section of the interest blank, and that they should be rated in accordance with the instructions which immediately precede that section of the test. To this end, S was presented with a copy of the instructions for the occupational part of the test and asked to read them. After S had finished reading the instructions he was given a sheet of paper with 45 like-indifferent-dislike (L-I-D) blanks arranged in three columns with 15 blanks per column. He was told to rate the words spoken by E on this sheet. E then explained that the purpose of the rating task was to assess the role of the preferences on the learning of meaningful words. Next E informed S of the specific sequence of behaviors that would be required of him. These included: (1) looking at the syllable when it was presented; (2) repeating the word spoken by E, once aloud and then once to himself, while still looking at the syllable; and (3) rating the word spoken by E on the sheet of paper provided for that purpose.

If S had no questions in regard to what was required of him, conditioning was begun. As in the orientation tasks, syllables were presented visually, words auditorily. The $\overset{UC}{S}$ words for each S were read from the S's conditioning

list (Table 1). E presented the $\overset{C}{S}$s by pressing a button which activated the slide projector. Approximately one second after a $\overset{C}{S}$ was presented E spoke the $\overset{UC}{S}$ word which was associated with it. While looking at the syllable, S repeated the word spoken by E once aloud and once to himself, and then rated the word on the sheet of L-I-D blanks. During this process E sat behind and to the right of S, a position which made possible the monitoring of S's rating of the $\overset{UC}{S}$ words. S's completion of the rating of a word acted as a cue for the presentation of the next slide. This sequence was continued until all 45 slides had been presented.

Post-Conditioning Phase:

After completion of the conditioning phase, S was told that his learning of the syllables would first be assessed. In addition, he was told that a measure of how he felt about each of the syllables was necessary since this might have affected his learning of them. E then placed before S a large chart depicting a seven point evaluative rating scale on which the polar terms were pleasant and unpleasant, on on which three X's appeared in the syllable position. The scale on the chart was of the following construction:

XXX

pleasant:___:___:___:___:___:___:___:unpleasant

Ss were specifically instructed as to the meaning of each scale position. Beginning at the extreme left and moving to the right the adjective labels that were applied to the positions were: very pleasant, quite pleasant, slightly pleasant, inbetween, slightly unpleasant, quite unpleasant, very unpleasant. After S indicated that he understood the rating procedure, he was given a booklet which contained seven semantic rating scales, each on a separate page, and each with a different syllable in the syllable position above the scale. The

syllables to be rated were the three involved in the study, plus WUH, POJ, GIW, and DAX. S was asked to rate the syllables one at a time and to indicate on the bottom of each page (by writing "yes" or "no") whether the syllable was one that had been presented in the experiment. S was told that the purpose of this latter procedure was to find out if the syllables had been learned.

After rating the syllables, S was instructed to turn to the next page of the booklet. On this page were printed the names of sixty occupations that had been drawn from the occupational section of the Strong. In keeping with the guise of the experiment, S was asked to underline those items that he remembered E saying during that part of the experiment in which syllables and words were presented in combination. S was given three minutes to complete this task. He was then instructed to turn the booklet over and to record on the back of the last page any thoughts that had occurred to him during the course of the experiment which he thought relevant, such as ideas about the purpose of the experiment.

Lastly, as each S left the experimental room he was asked to refrain from discussing the experiment with any of his classmates. It was emphasized that the experimental findings would be invalidated if Ss were included who had prior knowledge of the procedures used in the study.

RESULTS

The first analysis of the results involved the extent to which the interest items that had been selected for attitudinal value actually had that value at the time of the conditioning. Mean evaluative meaning scores were obtained for each S for the 15 items chosen to be positive $\overset{UC}{S}$ words and for the 15 items chosen to be negative $\overset{UC}{S}$ words. This was done by transforming LIKE, INDIFFERENT, and DISLIKE responses to numerical values of 3, 2, and 1 respectively. A mean rating for the 15 items on the three point scale was computed for

each S. The means were obtained for the positive and negative items over the two experimental groups in the study.

Table 2 gives the mean scores of the $\frac{UC}{S}$ interest items at the time of the conditioning. These mean scores show the value of the independent variable in the classical conditioning procedure. The data indicate that the items selected from the Strong were functioning as $\frac{UC}{Ss}$ for attitudinal responses in the experiment proper. That is, as the mean scores indicate, the $\frac{UC}{Ss}$ that were employed to elicit positive attitudes were rated very positively and those that were employed to elicit negative attitudes were rated negatively. An analysis of variance applied to these data revealed that the main effect of differences in semantic rating was highly significant ($F=62.40$, $df=1/24$, p .001). Neither the main effect of groups nor the interaction between groups and $\frac{UC}{S}$ word ratings approached significance.

Insert Table 2 about here

Along the same lines, it is of interest to specify the actual number of conditioning trials that each S was subjected to during the conditioning phase of the experiment. That is, as the preceding results imply, not every item was rated in the conditioning phase in the same way that it had been rated by the S when he first took the Strong. Thus, although 15 positive attitude items had been selected for each S, along with 15 negative items, the ratings at the time of conditioning showed that not each of the attitude items functioned according to plan. Some of the items selected to produce attitudinal conditioning were shown by their ratings during the conditioning to be neutral. Trials involving such items would be considered as extinction trials. Moreover, some of the words were rated during the conditioning opposite to the way that they had originally been rated. Such trials would be considered to involve counter-conditioning.

Table 2

Mean Attitudinal Ratings of $\frac{UC}{S}$ Words

	Positive	-	Negative
Group 1	2.77		1.57
Group 2	2.69		1.48

The mean numbers of contitioning, extinction, and counter-conditioning trials the Ss received under the positive and negative conditioning treatments are shown in Table 3. The results indicate that the number of positive and negative conditioning trials that the Ss were actually exposed to was less than the possible 15, since there were intermittent non-conditioning and counter-conditioning trials mixed in. The majority of the trials that the Ss were exposed to, however, were genuine conditioning trials, which, again, indicates that the independent variable was presented as planned, albeit in less than the maximal intensity.

Insert Table 3 about here

At this point the primary results of the study can be presented. The Ss' attitude ratings of the $\underline{\overset{C}{S}}$ syllables, YOF and XEH, were analyzed in a 2x2 latin square (Lindquist, 1953, p.278), with conditioned attitude (pleasant-unpleasant), syllable (XEH and YOF), and group (1 and 2) as variables.

Two Ss in group one and two Ss in group two were excluded from the analysis of the data because their records indicated that they had perceived some relationship between certain syllables and pleasant and unpleasant words. This left an N of 13 in each group.

The 2x2 experimental design is represented in Table 4, which includes the means and SDs of the meaning scores. In group 1, as indicated by the difference in the means, positive attitudinal meaning was conditioned to the syllable XEH and negative attitudinal meaning to the syllable YOF: in group 2 this was reversed.

Insert Table 4 about here

The analysis of the data is presented in Table 5. The results indicate that the hypothesized conditioning effect was reliable. The F for the conditioned attitude variable is significant at .01. Neither the group nor the

Table 3

Mean Number of Conditioning, Extinction and

Counter-conditioning Trials

	Mean Positive Trials	Mean Negative Trials
Conditioning	10.92	8.77
Extinction	3.54	5.15
Counter-conditioning	.54	1.08

Table 4

Means and SDs of Conditioned Meaning Scores

	XEH		YOF	
	Mean	SD	Mean	SD
Group 1	1.46	1.82	3.92	2.02
Group 2	4.31	1.73	2.46	1.15

Note: The pleasant pole scored 1; unpleasant, 7.

syllable variable was significant, although the latter approached significance ($p<.05>.10$).

Insert Table 5 about here

DISCUSSION

The results support the A-R-D analysis of the items of personality tests of motivation--specifically the items of the Strong Vocational Interest Blank. That is, the theory states that the items comprising personality tests of motivation consist essentially of words that elicit emotional responses, and that consequently the items also possess reinforcing and discriminative stimulus controlling properties. The present study verifies the first expectation, that if the items actually do elicit emotional responses it should be possible to use them to condition the emotional response to a new stimulus in classical conditioning paradigm. When one new stimulus was paired with a group of interest items that elicited positive emotional responses (were scored LIKE) and another new stimulus was paired with interest items that elicited negative emotional responses, the two new stimuli were conditioned emotionally in the same direction as their associated interest items. The interest items were effective in producing the classical conditioning of emotional responses to the new stimuli.

It should be emphasized here that the use of nonsense syllables as the CSs was for the practical purpose of obtaining good experimental control. The principles should hold, however, with various types of stimuli. Thus, for example, the same procedures should be capable of producing positive attitudes towards people (or pictures, names, and so on) as well as toward other social stimuli. Thus, as an illustration, a person associated with items of "interest" to us will come to elicit positive attitudes in us. It is important to realize that the principles and conditions involved in the study would be expected to generalize to various areas of human behavior.

Table 5

Analysis of Variance of Conditioning Data

Source	df	MS	F
Between Ss			
Groups	1	1.23	.59
Error	24	4.24	
Within Ss			
Conditioned Attitudes	1	17.30	8.24*
Syllables	1	6.23	2.97
Residual	24	2.10	
Total	51		

*P .01

It is interesting to note that the conditioning took place with a mean of 8.77 conditioning trials in the negative direction and 10.92 trials in the positive direction--with several extinction and counter-conditioning trials involved in each case. This result is congruent with the previous finding that conditioning in this type of procedure appears to take place with only 8 conditioning trials (Staats and Staats, 1959), as well as with the finding that the classical conditioning of attitudes occurs with intermittent conditioning trials (Staats, Staats, and Heard, 1960).

The results also indicated that only two Ss in each of the two groups were aware of any relationship between the $\underline{\underline{C}}$ S syllables and positive and negative $\underline{\underline{UC}}$ S words. This low awareness in comparison to previous studies would seem to have resulted from three factors: (1) the experimental instructions and orientation tasks which were designed to cover the true purpose of the investigation; (2) the fact that the $\underline{\underline{C}}$ Ss were not on each presentation associated with only one type of emotional meaning, as indicated by the presence of extinction and counter-conditioning trials; and (3) the procedural modification which included the requirement that Ss rate the $\underline{\underline{UC}}$ S items during the conditioning.

A number of investigators (e.g., Clark, 1960; Lovinger, 1957; Shontz, 1965), while recognizing the predictive efficiency of the Strong have noted the lack of a theoretical substrate for what the items comprising the test measure. Staats has also noted this problem and has suggested that benefits would accrue to the field of personality theory and personality assessment if these two presently isolated domains were unified by a theoretical bridge based upon a sophisticated learning theory of human behavior, itself derived from basic laboratory studies and firmly anchored in general-experimental psychology. The manner in which a learning theory of this nature can be productively applied to the problem of coordinating personality theory and personality assessment can be

illustrated in the area of interests and interest measurement. That is, traditional statements concerning the origin, development, and definition of interests have often been characterized by a lack of specificity, and isolation from a comprehensive, rigorous personality theory (a theory that would provide a basis for deduction and the consequent extension of empirical work). Thus it has been suggested that interests develop as a result of the individual's practical adjustment to his environment (Carter, 1940); that interests are closely linked to personality development (Darley, 1960); and that "Interests are the product of interaction between inherited neural and endocrine factors, on the one hand, and opportunity and social evaluation on the other" (Super & Crites, 1962, p. 410).

A few psychologists, however, have discussed interests in somewhat more explicit terms and in a manner which may be related to the theory underlying the present investigation. Fryer (1931), for example, proposed an acceptance-rejection theory of interest measurement in which he suggested that LIKES represent a "turning toward stimulation" which may be correlated with pleasant experience, and DISLIKES a "turning away from stimulation" which may be correlated with unpleasant experience. Fryer stated that the LIKE and DISLIKE responses to interest test items are the result of learning but he did not specify the learning principles involved. Thorndike (1935), Tuttle (1940), and Strong (1943) emphasized the role of the law of effect in their theoretical formulations of interest development. Thus, according to these investigators, interests develop as a result of an activity being followed by agreeable or disagreeable consequences. This view, however, in addition to being inadequate because it was not part of a comprehensive learning theory of personality, was based upon an incomplete and ambiguous learning theory. The view is thus deficient in not considering the role of classical conditioning; it did not clearly indicate the principles in the formation of the emotional component of interest. Furthermore, the manner in

which the classical conditioning of emotional responses determines the instrumental functions of the stimuli involved was not seen.

By positing classical conditioning as basic to interest development and by indicating how this conditioning is integrated with the instrumental functions of stimuli, the A-R-D theory is able to explain interest phenomena that have confused past investigators. For example, the view that interests are developed as a function of activities being followed by rewarding and punishing consequences led to the prediction that abilities should be highly correlated with interests. The reasoning was that one must be able to successfully participate in an activity in order to derive satisfying consequences. Strong (1943), himself noted, however, that this prediction was not in accord with empirical evidence indicating that many interests are formed in the absence of direct participation in an activity. In puzzling over this fact, as well as other evidence contrary to his theory, Strong could only note that such interests might be the result of "social forces not yet recognized in this connection" (1943, p. 13).

According to A-R-D theory, however, rewarding an activity is a sufficient condition for creating interests, but not a necessary condition. It is sufficient in that the instrumental conditioning situation contains within it the elements of the classical conditioning paradigm. It is an unnecessary condition, however, in that the classical conditioning process can occur in the absence of any instrumental activity. Thus in the present experiment, for example, interest stimuli transferred their emotional properties to associated neutral stimuli through classical conditioning alone. Moreover, since words were used as both $\underline{C}$ $\underline{Ss}$ and $\underline{UC}$ $\underline{Ss}$, the study suggests that one of the social forces of such conditioning is language. That interests for, that is attitudes towards, various stimuli could be formed by classical conditioning involving language stimuli, as well as other stimuli, is clearly suggested.

To return to the point of origin of this discussion, it may be indicated that one of the purposes of the A-R-D theory has been to integrate diverse fields of psychology--in this case personality test measurement and the laboratory established principles of the A-R-D theory. This attempt at integration is seen as necessary both in making the basic learning theory into a general behavior theory as well as in improving the quality of the areas that deal with complex human behavior. In the present case, a number of investigators have noted the existence of a gap between personality theory and the measurement of personality variables. The A-R-D theory provides a conceptual framework within which the unification of these areas is possible. In the present investigation, as one example, the items comprising an empirically constructed test were shown to possess the hypothesized psychological property of eliciting conditionable emotional responses. The present study thus constitutes a construct validation of the test, and of the construct of interests as emotional responses, as well as a validation of A-R-D theory.

This construct validation is of importance in view of some contemporary efforts to reject traditional verbal measuring instruments. That is as has been indicated (1968), there has been a strong current in the operant conditioning movement to exclude anything that is not closely related to operant conditioning principles, methodology, and philosophy of science and theory construction. This orientation, severely restrictive for the establishment of a general behavior theory, has been shown in the area of specific interest in the present study--the measurement of differences in motivational variables. For example, "it has been suggested [by investigators of a Skinnerian orientation] that traditional measuring instruments should be discarded in favor of direct reinforcement procedures (see Patterson, 1967); that the reinforcing value of a stimulus should be directly assessed by determining whether it will strengthen a motor

behavior--rather than by seeing how the person responds to a verbal item. The present analysis, however, suggests that it should be possible to assess the reinforcing value of a stimulus by assessing any of its three stimulus functions, that of a $\overset{C}{S}$, that of an $\overset{R}{S}$, or that of a $\overset{D}{S}$ (as in rating the item). That is, the A-R-D conceptualization provides a behavioral rationale for the use of tests, and indicates that verbal test items are just as behaviorally appropriate as a direct operant conditioning procedure. The only criteria for the selection of the method would be resolved by economy of time and effort, transparency of method, and other practical considerations" (Staats, 1968, pp. 59-60).

The present study thus begins this task of showing that learning principles are common to and relevant for the personality measurement field, as well as to other basic concerns in psychology. Moreover, it does so in a manner that should have important theoretical and empirical heuristic effects. It will be additionally important to indicate that the other principles in the A-R-D theory also extend to personality measurement. Thus, studies are now underway to test the reinforcing value of interest inventory items and to test the discriminative stimulus value as well. In brief, the maximal significance of the present type of study is in beginning research to integrate the presently isolated areas of psychological study, including research and practice.

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Footnotes

[1] This experiment was conducted as part of a Ph. D. dissertation by the first author, as one of the studies in the second author's Office of Naval Research Contract N00014-67A-0387-0007 to investigate the A-R-D system and its significance in personality assessment, social interaction, and human motivation. The study was jointly written.

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13. ABSTRACT

An experiment was conducted to test the hypothesis that interest inventory items elicit classically conditionable attitudinal responses. A higher-order conditioning procedure was used in which items from the Strong Vocational Interest Blank were employed as $\underline{\underset{UC}{S}}$s and nonsense syllables as $\underline{\underset{C}{S}}$s.

Items for which the subjects had positive interest, as indicated by a pre-test, were paired with one $\underline{\underset{C}{S}}$; items of negative interest were paired with a different $\underline{\underset{C}{S}}$. Analysis of post-conditioning ratings of the syllables indicated that they had acquired the attitudinal component of the interest items with which they had been paired.

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